

Release Bulletin PCR CosimaX/ Corado Reader

Software Version 2.1 (A08)

4512 201 02656

Level 0 Documentation

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**SERVICE MANUAL - UNIT
732**

**Release Bulletin PCR CosimaX/ Corado Reader
Software Version 2.1 (A08)**

Author: B. Freytag

4512 201 02656

In case there are any questions concerning this manual,
please, send this LOPAD via fax to +49/(0)40/5078 2481

File: RB CosimaX 00762AA

List of pages and drawings (LOPAD)

**Manual Order No: 4512 988 00762
released 3/2006**

1 ... 32 (a/06.0)

1 CD 114Y5117002A08 / 4512 116 06506 part of the Reader's accessories from the
following s/n onwards:
Corado: # 57222568
Cosima X: # 57222319
or delivered via Service Logistics

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1. Release Information

1.1. Supplied Software

PCR CosimaX/ Corado Reader SW version 2.1 4512 201 02656

Consisting of:

- 1 CD 'CR-IR 362/363 APL Software Version 2.1' 4512 116 06506 = 114Y5117002A08
 - this Release Bulletin 4512 988 00762

The application software of the Reader is delivered on a CD ROM and has to be loaded onto a separate PC, the PCR Preview Unit/ Console or PCR Eleva Workspot.

The Reader itself contains permanent only a FTP program and a configuration file stored on the CPU board and the IMG board respectively.

After power-on, the Reader establishes a network connection to the console and loads from there its application software. Please refer also to chapter 2 "**Relation between Reader and the FTP Server**".

The **machine data** diskette contains a backup of the initial specific scanner data and is marked with the s/n of the Reader.

1.2. What's new?

Compared with version 2.0 (A07):

- IPL software 1.1 with better network interface driver to prevent IP overrunning problems logged as errors 10351, 10357, 10363 and 10452.
- New MUTL function in Mechanical 1 Check: Sensor check
- Measures against leading-edge detection error 10347 and 10348.
- Correction of returning two IPs to the same shelf when rebooting the Reader after an IP jam (10364).
- Supervision function for the thermistor in the erasure unit has been activated.
- Several other bug fixings (history file, shutter sensors, MUTL functions).

1.3. Known Limitations

- Some service functions of the RU PC- Tool are not supported yet. For details see service manual of the Reader.
- Always 'A' has to be used as Equipment Code (Reader ID).
- During software installation the error message 'The system cannot find the file specified' is displayed when the following four files have been written into the flash memory:
 IPH_FPMC.PRM IPH_SNIP.PRM IPH_TIME.PRM IPHRETRY.PRM
- The status indication of writing data into the flash memory may not be displayed. Do not turn-off the power immediately after upgrading or installing new software. Wait approximately 10 minutes and reboot the Reader by turning it off and on. Then confirm the software version displayed during boot up.

1.4. Compatibility

PCR Eleva Workspot	Rel. 1.0 →
PCR Preview Unit	Rel. 1.2 →
PCR User Terminal SW	Rel. 1.5L2, Rel. 1.5L3 and upwards is recommended
EasyVision RAD	Rel. 4.2L3 →

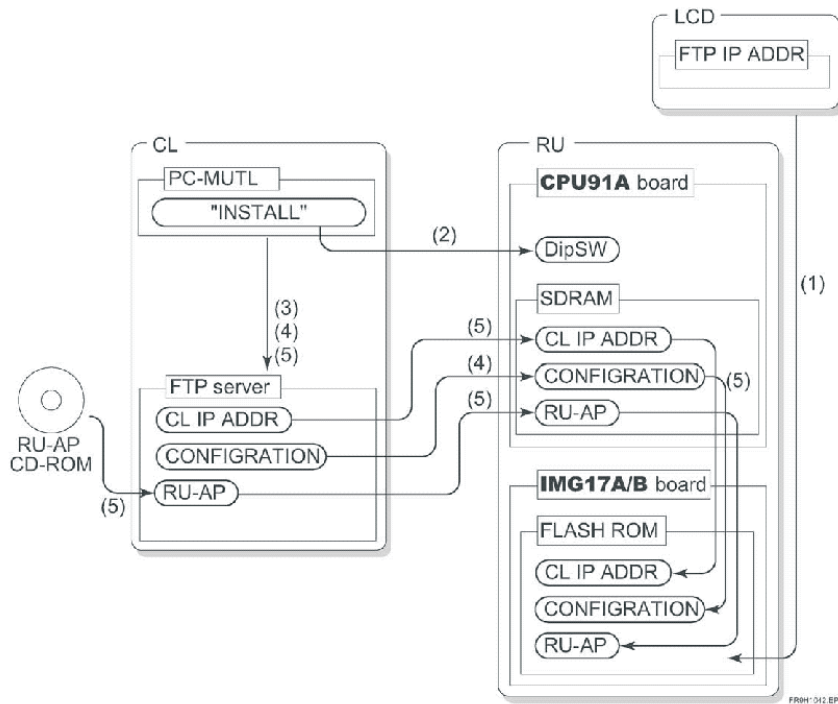
2. Relation between Reader and the FTP Server

The FTP Server of the Reader (= Reader Unit RU) is a separate PC (= Console CL).

Both communicate via a Fast Ethernet connection.

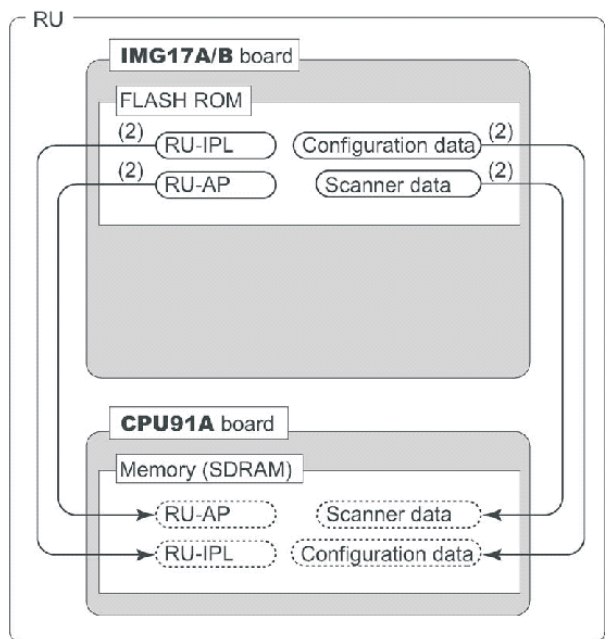
A detailed description can be found in the service manual of the Reader, chapter Machine Description.

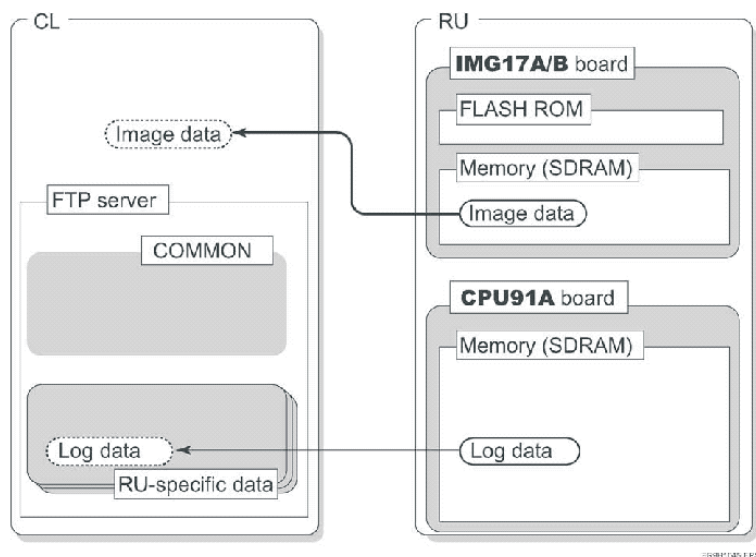
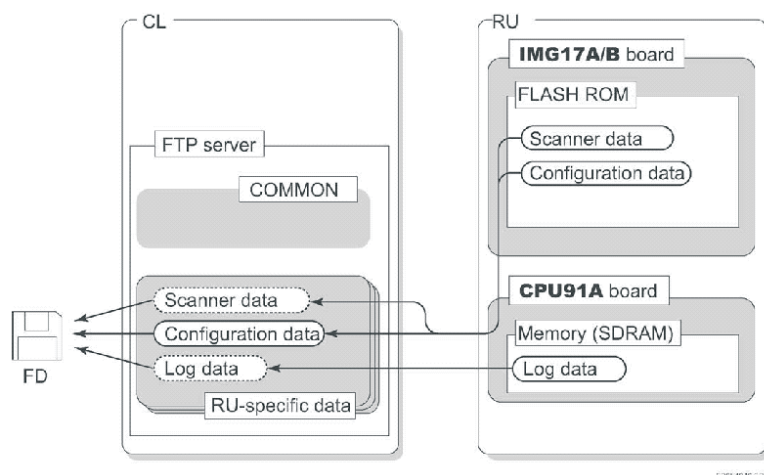
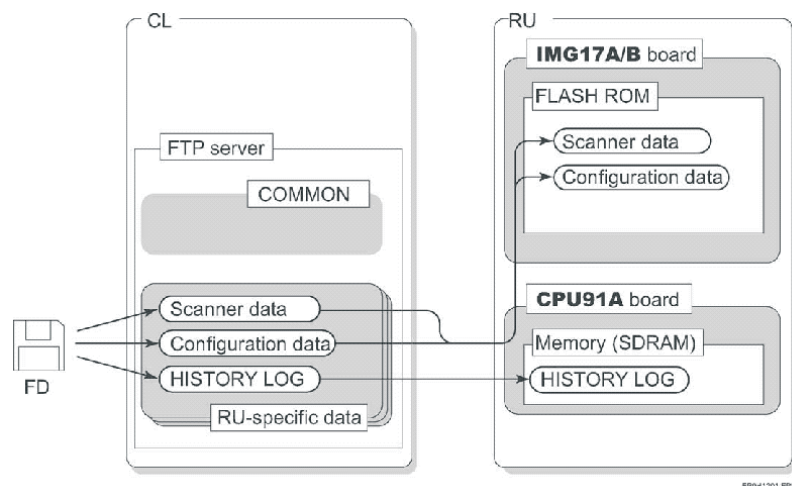
Data Flow during installation:



- (1) Setting the IP addresses of both the Reader (RU) and the PC (Console CL) at the Reader.
- (2) Starting the installation of the application software.
- (3) Setting the language and the brand OEM.
- (4) Setting the configuration.
- (5) Setting the IP address of the PC.

Data flow during boot- up:



Data flow during routine processing:**Data flow during a backup:****Data flow during a restore:**

3. PCR Eleva and Corado/ CosimaX Reader

PCR Eleva systems have running the service program Field Service Framework (FSF) on its so called Workspot. All the service relevant work (local and remotely) has to be done via this tool protected by Philips. The service instructions of this manual are general ones and do not reflect the specials of PCR Eleva. So negligible deviation in the use of the service functionality may occur. Further information may be included in the Release Bulletin of the PCR Eleva Workspot.

The following service menus of FSF activate the so called RU PC- TOOL program:

SW installation: General Functions/ Install software/ PCR Reader software

General: General Functions/ Utilities/ Start Maintenance Utility for PCR Reader (PC-MUTL)

Configuration: Configuration/ Local workspot PC/ PCR Reader configuration via PC-MUTL

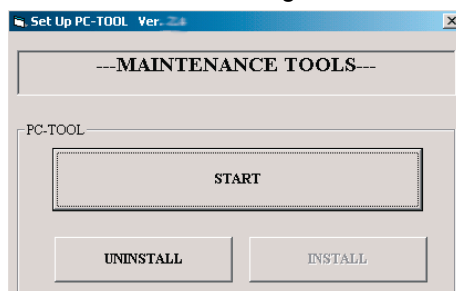
Diagnostics: Diagnostics/ Log Viewer/ Maintenance Utility for PCR Reader (PC-MUTL)

4. Software Upgrade

The latest software can be downloaded from the Philips Intranet. Please extract it to your service PC and burn it on a CD. Mark the CD with the information given in the file 'Readme.pdf'.

4.1. Upgrade the RU PC- Tool

1. Switch on the system.
2. Leave the application mode running on the PC: Keep depressed <Shift>, click on Shutdown and then OK to get the desktop window. Make sure to be in the Administrator mode of Windows®.
- For PCR Eleva: Use FSF according to chapter 3.
3. Insert the CD containing the new software. The installation window of the RU PC-Tool will be displayed.

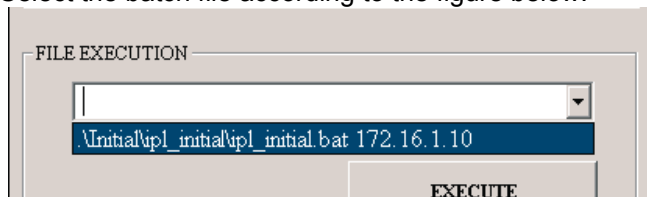


4. Select UNINSTALL to remove the current installed RU PC Tool of the version lower than 3.0.
5. Select INSTALL to install the new RU PC- Tool from CD.

4.2. Upgrade the IPL Software

The so called IPL software is the operating system of the Reader and is stored in the FLASHROM on the IMG board. It has to be upgraded from version 1.0 to 1.1. The new version contains a better network interface driver to prevent IP overrunning problems logged as errors 10351, 10357, 10363 and 10452.

1. Insert the CD-ROM into the drive.
The Maintenance Tool appears (PCR Eleva: via FSF and General Functions/ Install software).
2. Select the batch file according to the figure below.



3. Change the default IP address of the batch file to the actual used IP address of the Reader, e.g.
..._initial.bat 192.168.101.21
4. Click [Execute] to start the upgrade. Never turn off the power of the Reader in this situation.
5. Press [Enter] when the following messages appear.

```

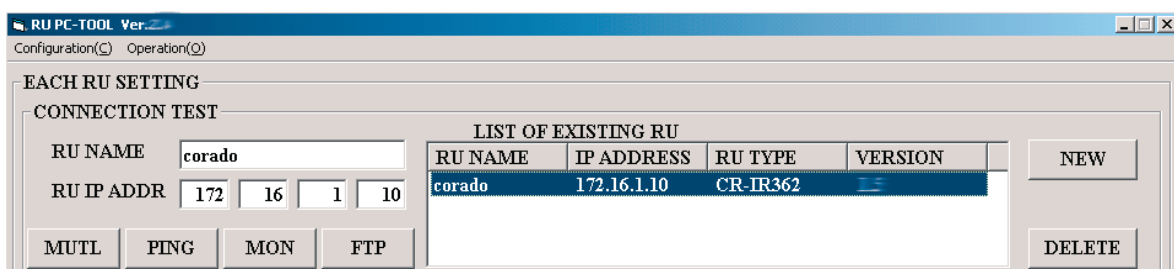
C:\WINNT\System32\cmd.exe
IPL software is being updated.
Wait a while.
CommDownloadIPLApp
value = 0 = 0x0
-> #Checksum
-> d(0xa00afffe,1,2)
a00afff0:                               5080 *                P *
value = 21 = 0x15
->
Updating IPL software is completed.
Confirm the value of checksum and reboot the RU.
Press any key.

```

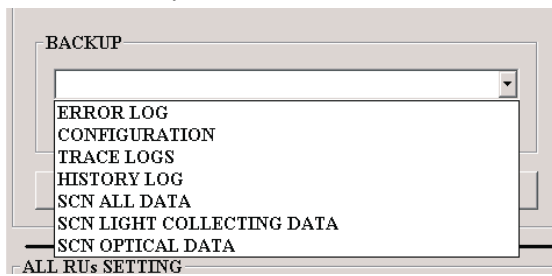
The upgrade to 1.1 can be checked via the designer's tag in the MUTL.

4.3. Upgrade the Reader Software

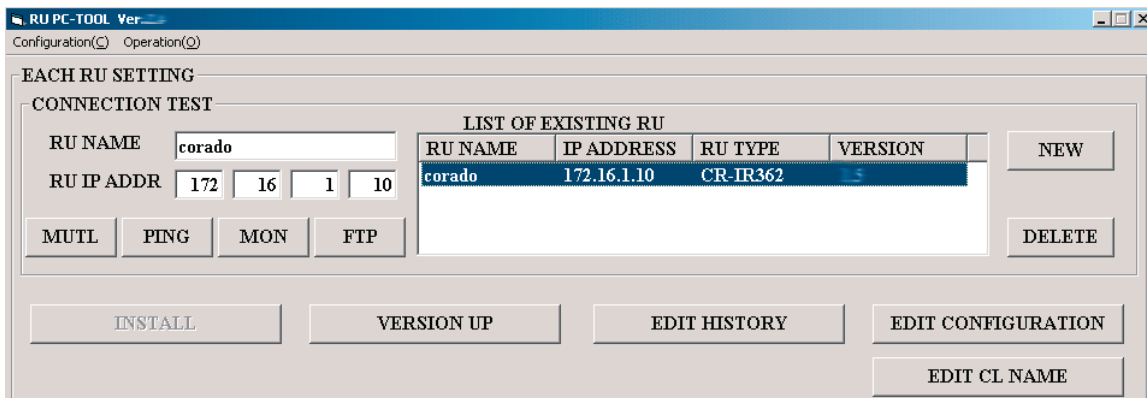
1. Insert the CD- ROM containing the new software. The installation window of the RU PC-Tool shall be displayed. For PCR Eleva: Use FSF according to chapter 3.
2. Select START to open the RU PC- Tool.
3. Select one of the installed Reader units.



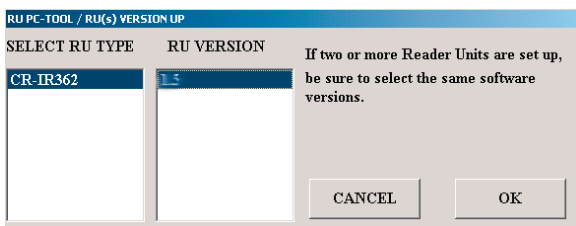
4. Make a backup of the CONFIGURATION, HISTORY LOG and SCN ALL DATA onto a floppy diskette.



5. Click on the button VERSION UP.



6. Select the software version to be installed for the Reader and click [OK].



7. Confirm the upgrade in the next window(s).
The steps of the upgrade process will be displayed in a command window.
During the upgrade the LED's of the four cassette slots are flashing.
8. After completing the installation check the version number of the software displayed.
9. Check the configuration and the history via their EDIT button.
10. Reboot the system, but not before 10 minutes after the installation has been left.
11. Check the functionality of the system.

There is no need to restore the data of the scanner, the configuration and the history.

During an upgrade normally all data will be kept and adapted to the new software release.

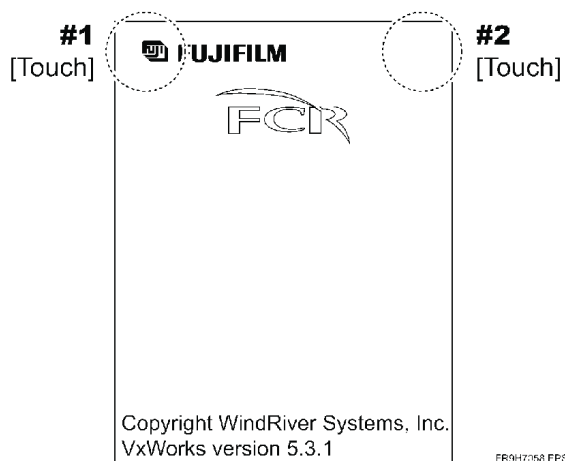
5. Initial Software Installation and Setup

Precondition:

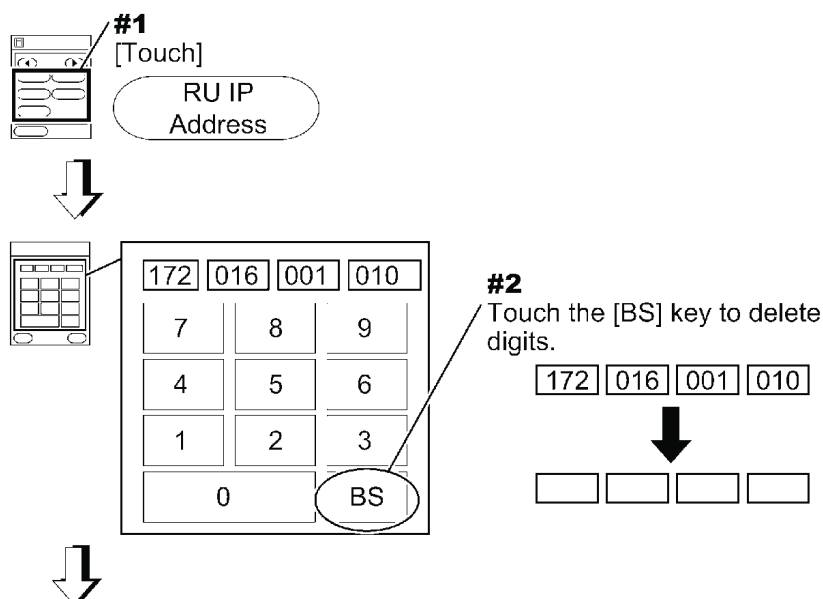
- All the network related information of the PCR components is available, e.g. IP addresses, IP names, netmasks and DICOM AET.
- At least the operating system is installed at the PC.
- During software installation both units may not be connected to the official hospital network. The Reader and the PC are linked together via an own local Fast Ethernet switch.
- Have on hand the CD containing the application software of the Reader.

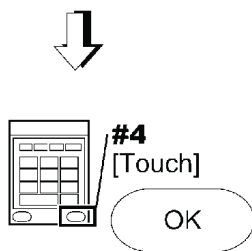
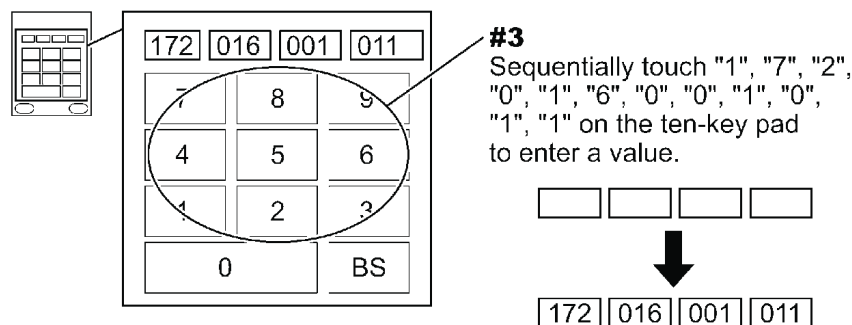
5.1. Setting the IP Addresses at the Reader

1. Switch on both the Reader and the PC.
2. Start the maintenance utility at the Reader during the initialisation phase.

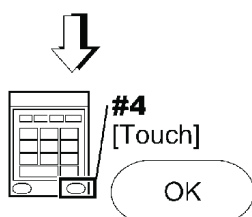
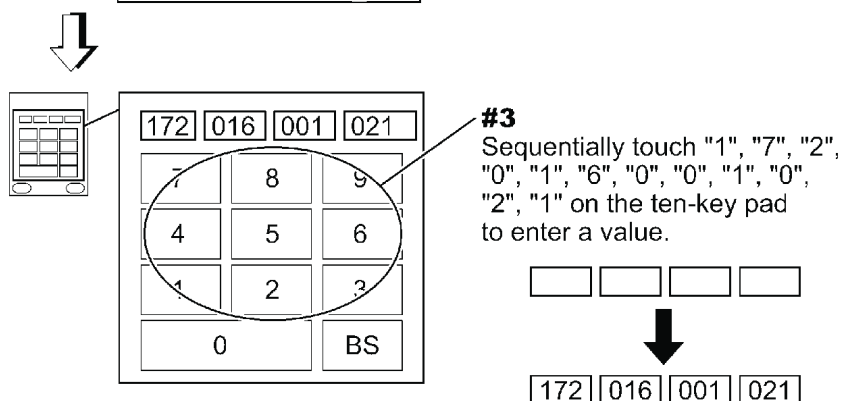
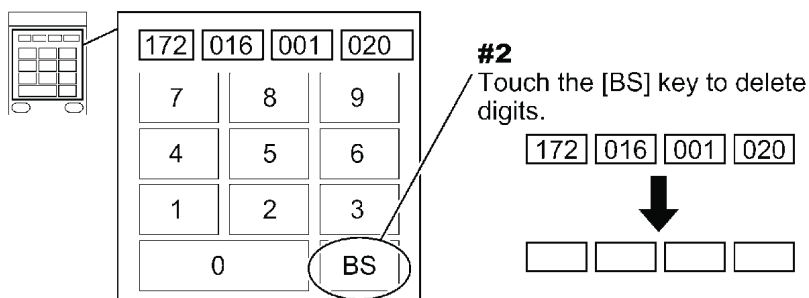
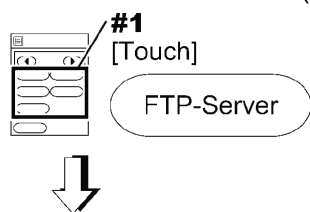


3. Set the IP address of the Reader.





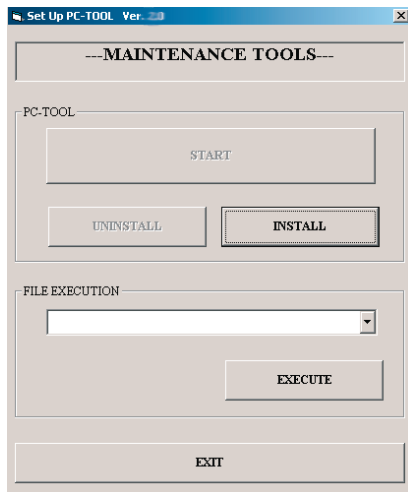
4. Set the IP address of the PC (FTP Server) at the Reader.



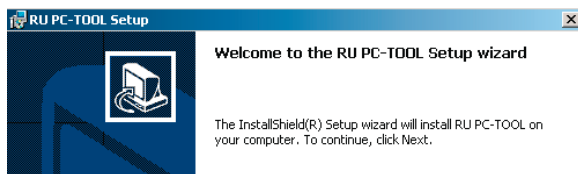
5.2. Installing the RU PC- Tool on the PC (FTP- Server)

1. Insert the CD 'CR-IR 362/363 APL Software Version ...' into the CD-ROM drive of the PC. Within a few seconds a set-up program is started. For PCR Eleva: Use FSF according to chapter 3.

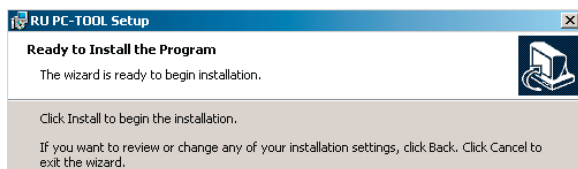
Click **[Install]**:



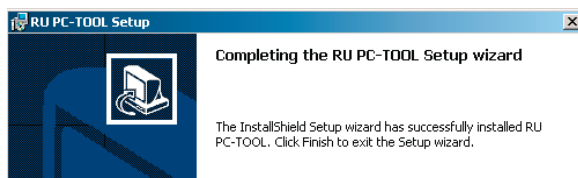
2. Click **[Next]**:



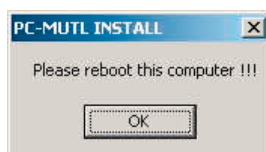
3. Click **[Install]**:



4. Click **[Finish]**:



5. Click **[OK]** to reboot the PC.

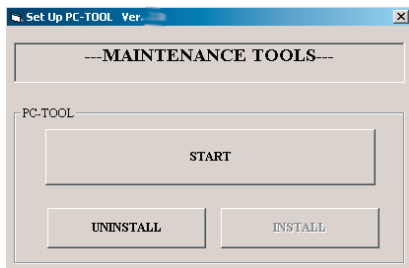


Note: Reboot the PC also in that case this window does not appear.

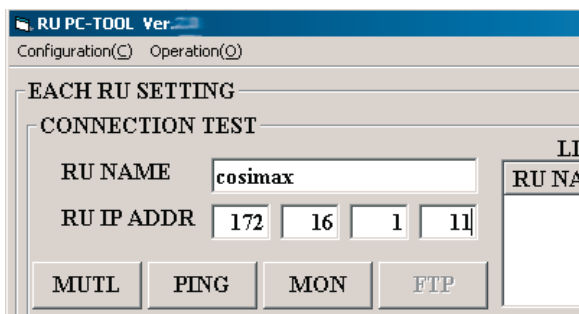
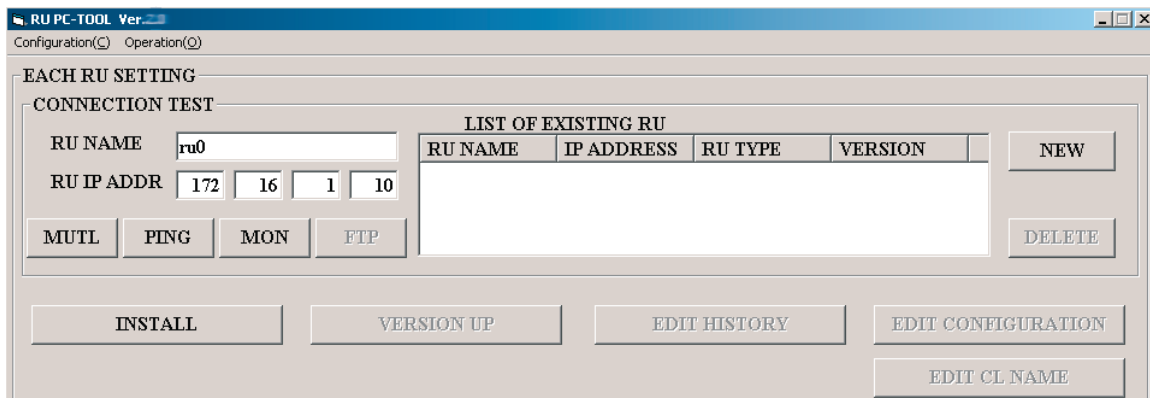
5.3. Installing the Application Software of the Reader on the PC

1. Re- insert the CD 'CR-IR 362/363 APL Software Version' into the CD-ROM drive of the PC. Within a few seconds the set-up program is started. For PCR Eleva: Use FSF according to chapter 3.

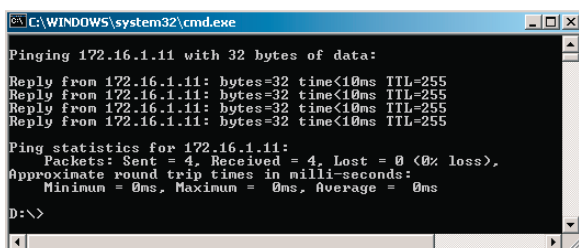
Click [**Start**] to install the RU PC- Tool software of the Reader:



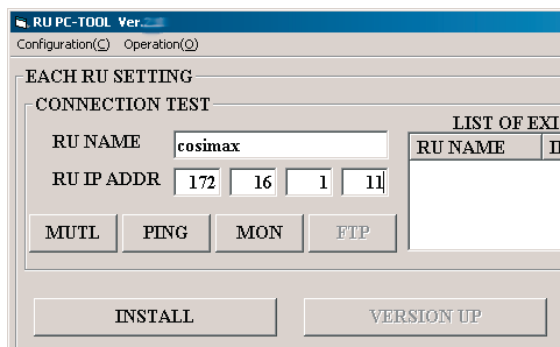
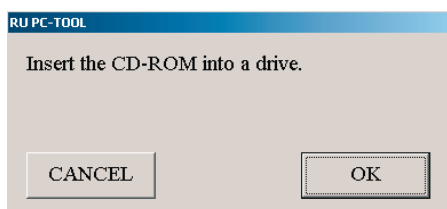
2. Click [**New**] and enter the RU name and RU IP address of the Reader:



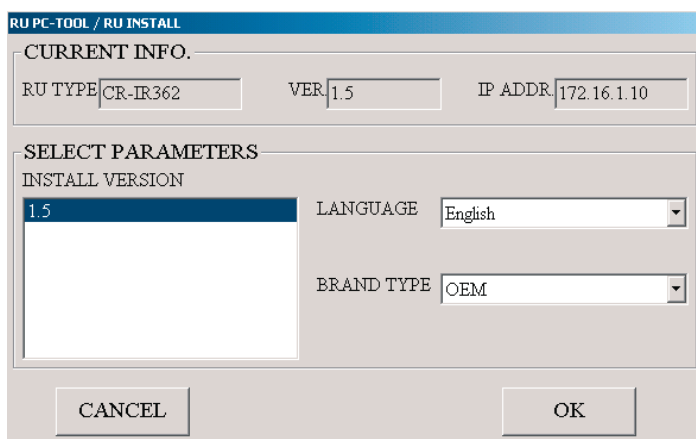
3. Click [**PING**] to check the communication. The following window must be displayed.



Close this window.

4. Click **[Install]**:5. Click **[OK]**:6. Select the following items and click **[OK]**:

- Language: The language for the display panel of the Reader.
- Brand Type: **OEM**
- Install Version: **2.1** (example only, select the highest of the listed versions)

7. Enter the configuration data and click **[SET]**.

RU PC-TOOL / CONFIG

RU Configuration Setting

EQUIPMENT CODE (A-Z)	A
RANGE OF ERASE MODE	ERASE1,ERASE2
ERASE MODE TIME OUT (0-999 [s])	20
ALARM (CASSETTE SET)	ON
WARNING OF OVERXRAY	LOG & MESSAGE
CR-IR362 BARCODE READER OPTION	NO
BOARD WARMING-UP WINDOW	NO

SET

EQUIPMENT CODE	Use always 'A'
RANGE OF ERASE MODE	Specifies the erasure mode range. ERASE 1: Primary erasure can be selected. ERASE 1, ERASE 2: Both primary and secondary erasures can be selected.
ERASE MODE TIMEOUT	Default : 20 sec
ALARM (CASSETTE SET)	Sets alarm ON/OFF when cassette is inserted. ON : Alarm sounds. OFF : Alarm does not sound
WARNING OF OVERXRAY	Selects X-ray over-exposure IP warning method. LOG & MESSAGE: Warning by log and message. LOG: Warning by log. NONE: No warning issued .
CR-IR362 BARCODE READER OPTION	Select NO
BOARD WARMING-UP WINDOW	Select NO

8. Select the default IP address and click **[Modify]**:

RU PC-TOOL / CL NAME

DELETE NEW

IP ADDRESS	CL NAME	MASTER CL
172.16.1.21	CL0	CL0

>> <<

MODIFY SET

9. Enter the IP address and the IP name of the PC and click **[SET]**:

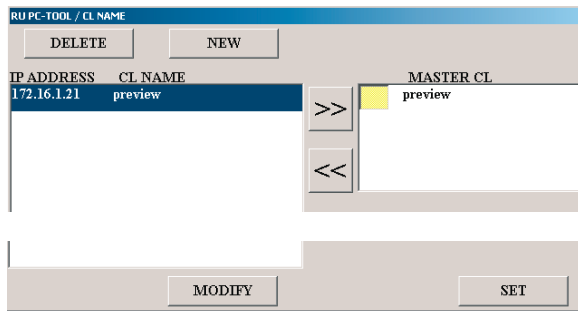
RU PC-TOOL

CL IP ADDRESS CL NAME

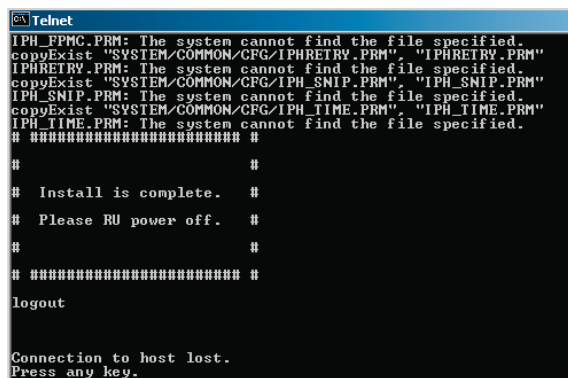
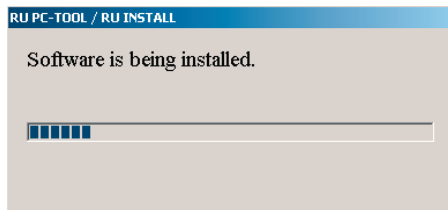
172 16 1 21 preview

CANCEL SET

10. Click **[SET]**:



The following windows must be displayed:



Note:

While data is being written into the FLASH ROM of the Reader, never turn OFF the power. If the power is turned OFF, the program residing in the memory is corrupted, so that the Reader cannot be rebooted.

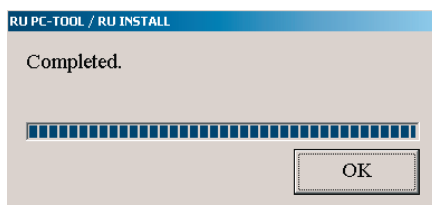
Writing into the FLASHROM will take about four minutes.

However, do not reboot the system before 10 minutes after the installation has been left.

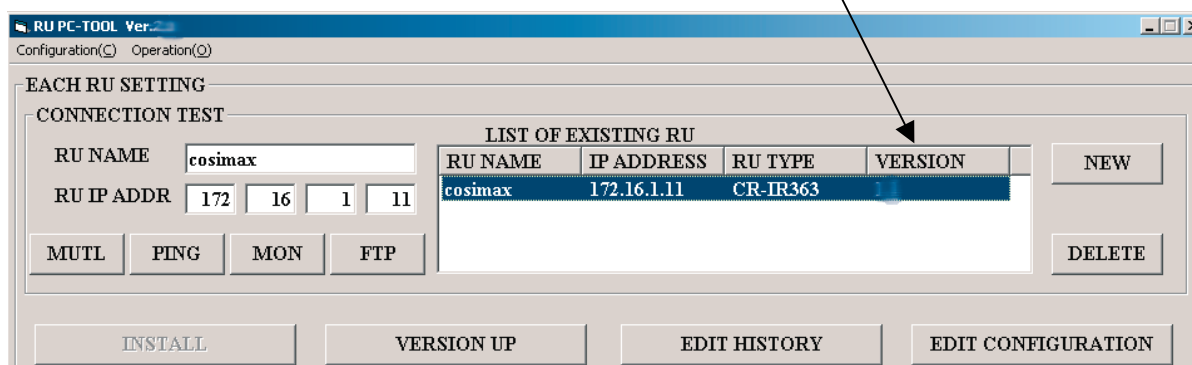
During the upgrade the LED's of the four cassette slots are flashing.

11. Press the <Enter>.

12. Click [OK] to finish the installation:



13. Check the version of the Reader software: --> **2.1** (example only)



14. Click [**X**] to close the **RU PC- Tool**.

15. Click [**EXIT**] to close the set-up program.

16. Remove the CD and go back to the Release Bulletin of the application PC.

17. Restart the Reader.

6. Configuration

The meaning of the configuration parameters are described in the service manual of the Reader.
See section Maintenance Utility.

6.1. Changing the Configuration

1. Start up the RU PC- Tool as described in chapter **Starting the RU PC- Tool**.
2. From the **LIST OF EXISTING RU**, click the Reader which configuration file is to be set.
3. Click **[EDIT CONFIGURATION]**:

The screenshot shows a window titled "RU PC-TOOL / CONFIG". Inside, there is a section titled "RU Configuration Setting" with several parameters and their values:

- EQUIPMENT CODE (A-Z): A
- RANGE OF ERASE MODE: ERASE1,ERASE2
- ERASE MODE TIME OUT (0-999 [s]): 20
- ALARM (CASSETTE SET): ON
- WARNING OF OVERXRAY: LOG & MESSAGE
- CR-IR362 BARCODE READER OPTION: NO
- BOARD WARMING-UP WINDOW: NO

At the bottom right of the window is a button labeled "SET".

EQUIPMENT CODE	Use always 'A'
RANGE OF ERASE MODE	Specifies the erasure mode range. ERASE 1: Primary erasure can be selected. ERASE 1, ERASE 2: Both primary and secondary erasures can be selected.
ERASE MODE TIMEOUT	Default : 20 sec
ALARM (CASSETTE SET)	Sets alarm ON/OFF when cassette is inserted. ON : Alarm sounds. OFF : Alarm does not sound
WARNING OF OVERXRAY	Selects X-ray over-exposure IP warning method. LOG & MESSAGE: Warning by log and message. LOG: Warning by log. NONE: No warning issued .
CR-IR362 BARCODE READER OPTION	Select NO
BOARD WARMING-UP WONDOW	Select NO

4. Change the data as needed.
5. When done click **[SET]**. The configuration is saved to hard disk and the system returns to the main menu.

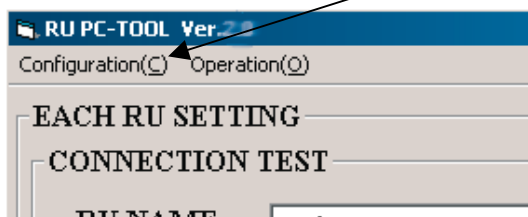
6.2. Changing IP Address and IP Name of the Reader

Be carefully during a change of IP addresses. It is recommended to disconnect the system from an existing hospital network and to use an own network switch temporarily.

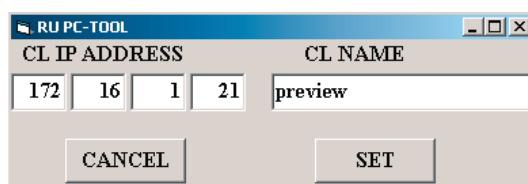
1. Reader: Delete the old IP address and enter the new one by using the Reader's Maintenance Utility.
2. PC (FTP- Server): Delete the old registered Reader unit at the FTP Server by using the RU PC- Tool.
3. Perform a complete new installation of the Reader according to the chapter 'Installing the Application Software of the Reader at the FTP- Server'.
4. Restart the system and check both the application and the service functionality.

6.3. Changing IP Address and IP Name of the FTP- Server

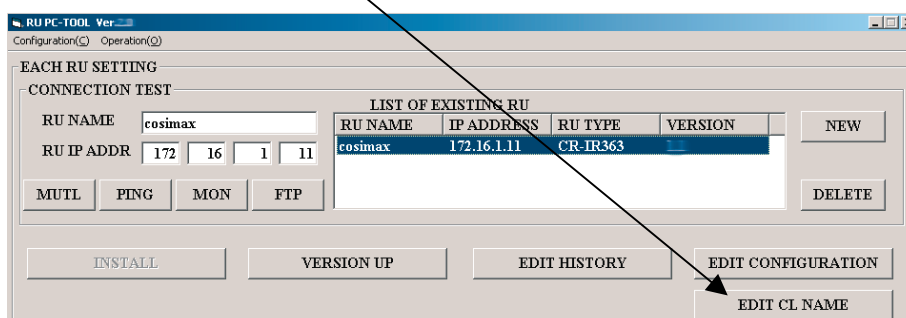
1. Reader: Delete the old IP address and enter the new one by using the Reader's Maintenance Utility.
2. PC (FTP- Server): Change the IP address or the name via the facility of the operating system, e.g. WINDOWS 2000, according to the Release Bulletin of the PC.
3. Restart the PC.
4. Start the RU PC- Tool and open **[Configuration (C)]**:



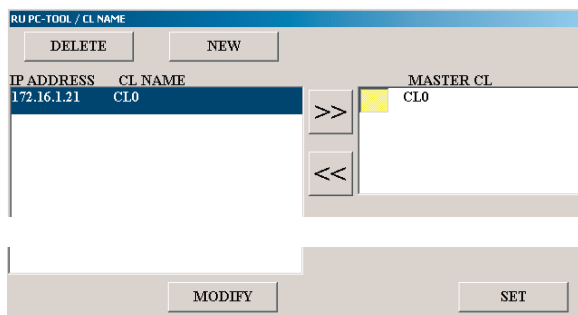
5. Enter the new IP address or name and click **[SET]**:



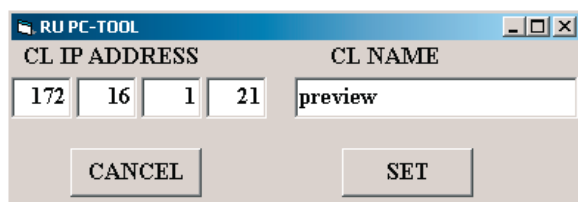
6. Click on **[EDIT CL NAME]**:



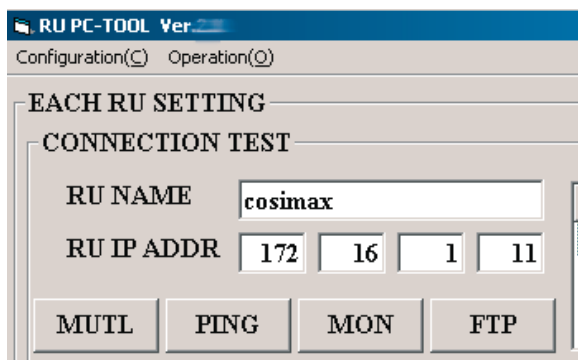
7. Select the IP address and click **[Modify]**:



8. Enter the new IP address and the IP name of the PC and click **[SET]**:



9. Click on **[PING]** and **[FTP]** to check the communication with the Reader:



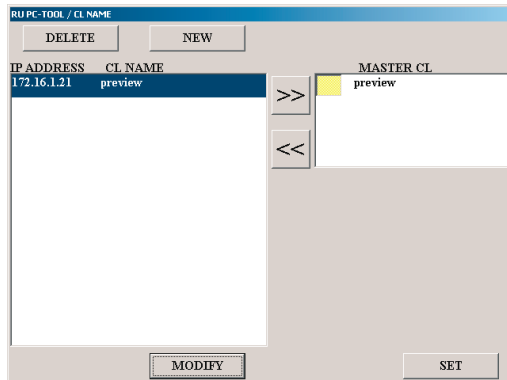
10. Restart the system and check the normal application.

6.4. Trouble with Configuration

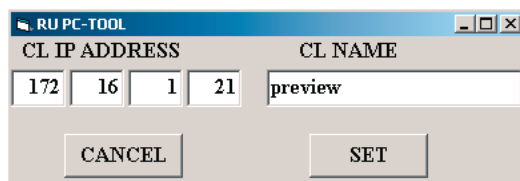
Example: 'CR Console communication error'.
Line error indication on the display panel of the Reader.

Cause: IP name and IP address configured at the PC do not match the configuration at the Reader.

1. Solution: Check the FTP Server for the Reader at the PC:
- Start the RU PC- Tool.
 - Select the Reader unit.
 - Click on [Edit CL name].



- Select the configured console for the Reader.
- Click on [MODIFY] to change the data.



- Enter the matching IP address or IP name and click [Set].

Be sure that the entered data are identical with the one set in the operating system.

2. Solution: Check or change the IP addresses configured at the Reader:
- Enter the maintenance tool at the Reader.
 - Select [RU IP address].
 - Check the IP address of the Reader.
 - Select [FTP- Server].
 - Check the IP addresses of the FTP-Server.

In case the IP address of the Reader has been changed, the old configured Reader unit must be uninstalled at the PC.

After this a software installation has to be performed for the new Reader.

3. Solution: Check 'Reader name' and 'Reader type' inside the configuration of the Preview Unit and the PCR Eleva Workspot (Configuration/ Network/ Workspot status of PCR Reader) respectively.

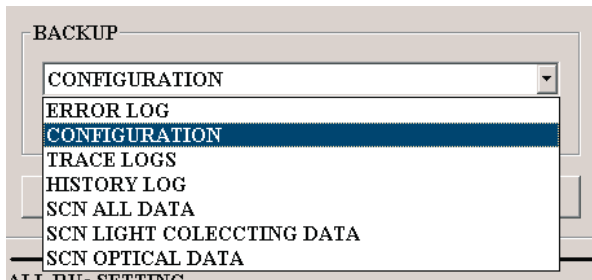
6.5. Backup and Restore

Start the RU PC- Tool at the PC.

Have on hand a formatted diskette or the diskette containing the backup data.

6.5.1. Backup

1. To back up reader-specific data select the data you want to save from the list:

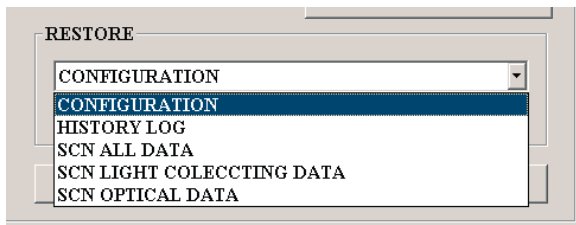


Recommend data: CONFIGURATION, SCN ALL DATA, HISTORY LOG

2. Click **[EXECUTE]** and follow the instruction given.

6.5.2. Restore

1. To restore reader-specific data select the data you want to restore from the list:



2. Click **[EXECUTE]** and follow the instruction given.

In the scope of the delivery of each Reader is a floppy diskette marked with **machine data** and the s/n of the Reader. This diskette contains the initial specific scanner data.

7. Uninstall Software

Two software packages of the Reader are stored at the PC, the RU PC- Tool and the application software of the Reader unit.

Uninstall the RU PC- Tool:

1. Insert the CD-ROM containing the application software of the Reader.
A start-up program starts automatically.
For PCR Eleva: Use FSF according to chapter 3.
2. Click [Uninstall] and follow the instructions of the uninstall wizard.

Uninstall the application software:

1. Insert the CD-ROM containing the application software of the Reader and wait for start-up program.
For PCR Eleva: Use FSF according to chapter 3.
2. Click [Start] to open the RU PC- Tool.
3. Click [Uninstall].
The application software and the configuration of **all** Readers will be removed.

8. Servicing the Reader

8.1. Local Service

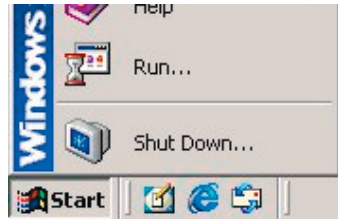
All service functions of the Reader are managed by the program **RU PC- Tool** running on the PC. A subpart is the program **MUTL** offering unit tests, board tests and shading and sensitivity adjustments.

Starting the RU PC- Tool:

1. Exit the application running on the PC by pressing the <Shift> button and clicking on the Exit field. The Windows desktop appears. For PCR Eleva: Use FSF according to chapter 3.
2. Start the RU PC- Tool by doing the following:

Click 

Click **Run...**



Enter or browse for **c:\Program Files\FujiFilm\FCR\TOOL\RuPcTool\RuPcTool.exe** and click **[OK]**.

3. Select the Reader unit in the **LIST OF EXISTING RU**. Now all service functions are selectable.

Recommendation: Create a shortcut to the desktop of the PC.

Note: Do not use the RU PC- Tool and the normal application at the same time.

Then the RU PC- Tool may not work correctly.

One exception is the shading and sensitivity adjustment procedure of the scanner unit.

For further explanations please refer to the service manual of the Reader.

8.2. Remote Service at PCR Classic systems

The RU PC- Tool and with this all the service functionality can be controlled remotely via the FTP Server by using special remote software like Remote Administrator. The login data are as follows:

	CosimaX	Corado
login	cr-ir363	cr-ir362
password	cr-ir363	cr-ir362

With the aid of the RU PC- Tool the actual error and trace logs will be sent to the FTP Server.

From there the interesting files can be transferred to the remote PC.

Interesting paths and files at the FTP Server:

Basic path: C:\Program Files\FujiFilm\FCR\[Reader type]\SYSTEM\[IP address] \ ...
 Software version: version.dat
 Error logs: ...\\LOG\\ERROR*. * (all files)
 Trace data: ...\\TRACE\\ *. * (all files)
 IOT data: ...\\IOT\\iot.log
 Configuration: ...\\CONFIG\\lrset.cfg
 History file: ...\\STATISTIC\\History.cfg
 Scanner data: ...\\MACHINE\\COLLECT\\ *.DAT
 ...\\MACHINE\\OPTICAL\\ *.DAT

9. Sensitivity and Shading Adjustment

Precondition:

The scanning unit of the Reader has been cleaned before.

The image format and the leading edge detection are well adjusted, especially no white blank portions are visible at the edges.

All the current scanner data have been copied to a floppy diskette by using the service program RU PC-Tool.

The complete PCR system is running in the normal application mode.

PCR Classic systems: At least Preview Unit SW version 1.2L3 is required for HR and HR-BD.

Reference documents of the Reader:

- Section: Checks MC Chapter: Shading/ Sensitivity Correction

Overview of exposure data and applicable chapter for adjustment depending on used IP type:

Adjustment procedure for: ST= standard, HR= high resolution ST-BD= ST at both sides HR-BD= HR at both sides	Corado Reader		CosimaX Reader		
	ST	ST HR	ST ST-BD HR HR-BD	ST ST-BD HR-BD	HR- BD
ST sensitivity/shading/shading speed --> chapter 8.4	80 kV 1mR	80 kV 1mR	80 kV 1mR	80 kV 1mR	
ST- BD sensitivity and shading --> chapter 8.4			80 kV 1mR	80 kV 1mR	
HR sensitivity --> chapter 8.5		80 kV 3.6 mR	80 kV 3.6 mR		
HR-BD sensitivity --> chapter 8.6			25 kV 20 mR	25 kV 20 mR	25 kV 20 mR
HR-BD shading speed --> chapter 8.7			80 kV 15 mR	80 kV 15 mR	80 kV 15 mR ¹⁾

1) If not possible then the factory data should be used.

The shading speed can be corrected by using 25 kV / 20 mR but it is not recommended.

9.1. Sensitivity Check with Type ST and ST-BD

1. Uniformly expose the largest IP of the type ST (e.g. 14" x 17" or 14" x 14") and ST-BD (e.g. 24 x 30 cm) with a dosage of about **1mR / 8.7 µGy** at about **80kV**.
Use a large SID (min. 1.8m). Don't use any filters. Open the shutters of the collimator completely.
The green marker of the cassette shows to the anode of the tube.
Check the dosage with a dosimeter.
2. Register (barcode) the IP under the examination **SERVICE/ TEST** and the view **SENSITIVITY**.
Be sure that this view is programmed to EDR = 1 (semi mode) and MPM code 0900.
Use post processing code U0000900 (GA=1, GT=A, GC=1.2, GS=0.0, RN=3, RT=F and RE=0.0).
Alternatively the examination SERVICE/ TEST/ Semi Mode/ AVE 4.0 with the MRM code 090E can be used. The MRM code 090E with L = 4 will produce an image with a more homogeneous gray level and lower tolerances respectively.
3. **10 ... 11 minutes** after the exposure has been made, enter the cassette into the Reader.
4. For the result look at the image console:
S value: **170 ... 200 ... 250**
Pixel value: **450 ... 511 ... 570** valid for EasyVision RAD (10 bit, 0 = black)
1850 ... 2050 ... 2250 valid for PCR Eleve and 1 mR/ 8.7 µGy (12 bit, 0= white)
2150 ... 2350 ... 2550 valid for PCR Eleve and 2 mR/ 17.4 µGy

If there are greater deviations perform the sensitivity and shading correction.

Note: It is possible to use a greater dose, e.g. 2 mR/ 17.4 µGy.
The S value will decrease respectively to 85 ... 125.

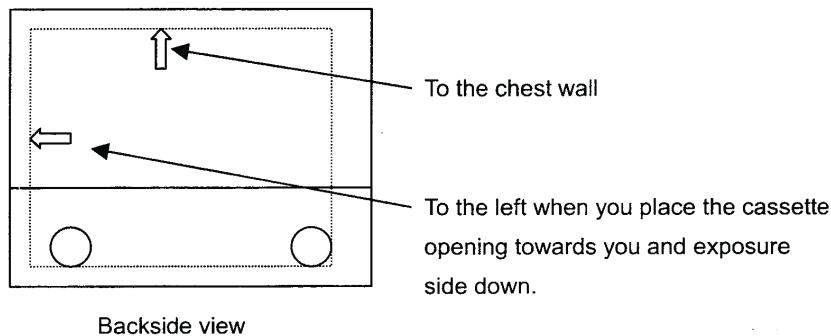
9.2. Sensitivity Check with Type HR

1. Uniformly expose the largest available HR cassette, e.g. 24 x 30 cm, with a dosage of about **3.6 mR / 31.32 µGy** at about **80kV**.
Use a large SID (min. 1.8m). Don't use any filters. Open the shutters of the collimator completely.
The chest wall side of a mammo cassette shows to the cathode of the tube.
The green marker of a standard cassette 18 x 24 cm shows to the anode of the tube.
Check the dosage with a dosimeter and write down the measured value and the time.
Now you have 10 minutes until the IP must be read out.
2. Register (barcode) the IP under the examination **SERVICE/ TEST** and the view **SENSITIVITY**.
Be sure that this view is programmed to EDR = 1 (semi mode) and MRM code 0900.
Use post processing code U0000900 (GA=1, GT=A, GC=1.2, GS=0.0, RN=3, RT=F and RE=0.0).
Alternatively the examination SERVICE/ TEST/ Semi Mode/ AVE 4.0 with the MRM code 090E can be used. The MRM code 090E with L = 4 will produce an image with a more homogeneous gray level and lower tolerances respectively.
3. **10 ... 11 minutes** after the exposure has been made, enter the cassette into the Reader.
4. For the result look at the image console.
S value: **84 ... 120 ... 156**
Pixel value: **450 ... 511 ... 570** valid for EasyVision RAD (10 bit, 0 = black)
1850 ... 2050 ... 2250 valid for PCR Eleve and 3.6 mR/ 31.32 µGy (12 bit, 0= white)

If there are greater deviations perform the sensitivity and shading correction.

9.3. Sensitivity Check with Type HR-BD

1. Make sure the IP is aligned at the following edges.

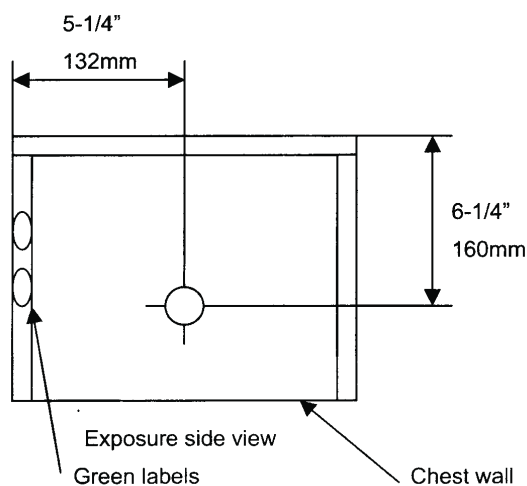


2. Expose the largest available size of the mammo cassettes, e.g. 24 x 30 cm.

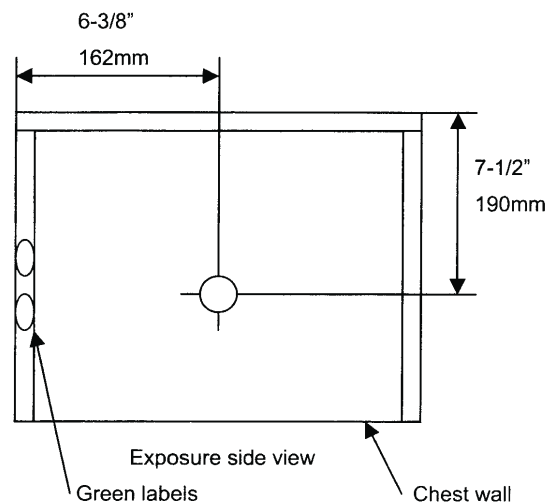
Exposure condition: **25 KV, 20 mR**, Mo/Mo anode and filter (approx. 5.60 mAs, cassette in slot)

Check the dosage with a dosimeter (20mR = 174µGy) before the reference exposure at the points shown below:

18x24cm cassette



24x30 cassette



3. Wait **10 ... 11 minutes** before entering the cassette into the Reader.
Select examination: **SERVICE/ TEST** and the view **SENSITIVITY**. Be sure that this view is programmed to EDR = 1 (semi mode) and MRM code 0900 and **high matrix**.
For PCR Eleva: Create/ select the view **Sens high matrix**.

4. For the result look at the image console, e.g. EasyVision.

S value: **84 ... 120 ... 156**

Pixel value: **450 ... 465 ... 480** valid for EasyVision RAD (10 bit, 0 = black)
1850 ... 2050 ... 2250 valid for PCR Eleva and 1 mR/ 8.7 µGy (12 bit, 0= white)

ROI of 18x24 cm IP: approx. 120 ... 165 mm from the start line opposite to the chest wall side.

ROI of 24x30 cm IP: approx. 150 ... 205 mm from the start line opposite to the chest wall side.

If there are greater deviations perform the sensitivity and shading correction.

9.4. Shading/ Sensitivity Adjustment for Standard Type ST and ST- BD

During this procedure three adjustments will be performed automatically:

- Sensitivity
- Shading
- Shading speed for ST including ST- BD and HR

If also ST- BD cassettes are used by the customer the sensitivity and shading adjustment has to be performed as well.

1. Uniformly expose the largest cassette with a dosage of about **1mR / 8.7 µGy** at about **80kV**.
Use a large SID (min. 1.8m). Don't use any filters. Open the shutters of the collimator completely.
Green label of the cassette shows to the anode of the tube.
Check the dosage with a dosimeter and write down the measured value and the time.
Now you have 10 minutes until the IP must be read out.
2. Register (barcode) the IP under the examination **SERVICE/ TEST** and the view **SENSITIVITY**.
3. Start the **RuPcTool** at the FTP Server parallel to the normal application.
At Preview Unit:
 - Press <Ctrl> + <Esc> to get the task bar of WINDOWS.
 - Click on Start/ Run and browse for **c:\Program Files\FujiFilm\FCR\TOOL\RUPC\Tool\RUPCTool.exe**.
 At PCR Eleva Workspot:
 - Start RuPcTool via FSF.
4. Select the Reader to be adjusted.
5. Select **MUTL**.
6. Quit the message window 'Maintenance in progress...' at the Reader by touching the upper left and right corner of the display if applicable.
7. Select **For Design/ Scanner/ Scanner Sensitivity Data** and write down the following values:

Sensitivity HV value/ One Side ST:	.....	e.g. 508	for ST only
Sensitivity HV Value/ Both Side ST (Front Side):	.....	e.g. 566	for ST- BD only
Sensitivity HV Value/ Both Side ST (Back Side):	.....	e.g. 682	for ST- BD only
8. Leave this screen with CANCEL.
9. Select **Scanner Check/ Correction**.
10. In **Shading/Sensitivity Correction** enter the measured dose in [mR], e.g. 1.05, and click SET and OK.
11. After **10 minutes** the IP has been exposed put the cassette into the Reader.
12. Check for 'Result-OK' in the window of RU PC-TOOL.
13. Select **For Design/ Scanner/ Scanner Sensitivity Data** and write down the new HV value:

Sensitivity HV value/ One Side ST:	.....	for ST only
Sensitivity HV Value/ Both Side ST (Front Side):	.....	for ST- BD only
Sensitivity HV Value/ Both Side ST (Back Side):	.....	for ST- BD only
14. Leave the RU PC-Tool.
15. Repeat the sensitivity check. The S value must be in the range 180 ... 200 ... 220.
16. Make a backup of the scanner data (all).

Note: The sensitivity adjustment can also be executed by using a dose in a range of 0.5 to 10 mR.
Recommended is a value between one and two mR.

9.5. Sensitivity Adjustment for High Resolution Type HR

1. Uniformly expose the largest available HR cassette, e.g. 24 x 30 cm, with a dosage of about **3.6 mR / 31,32 µGy** at about **80kV**.
Use a large SID (min.1.8m). Don't use any filters. Open the shutters of the collimator completely.
The chest wall side of a mammo cassette shows to the cathode of the tube.
The green marker of the applicable standard cassette 18 x 24 cm shows to the anode of the tube.
Check the dosage with a dosimeter and write down the measured value and the time.
Now you have 10 minutes until the IP must be read out.
2. Register (barcode) the IP under the examination **SERVICE/ TEST** and the view **SENSITIVITY**.
3. Start the **RuPcTool** at the FTP Server parallel to the normal application.
At Preview Unit:
 - Press <Ctrl> + <Esc> to get the task bar of WINDOWS.
 - Click on Start/ Run and browse for **c:\Program Files\FujiFilm\FCR\TOOL\RuCpTool\RuCpTool.exe**.At PCR Eleva Workspot:
 - Start RuPcTool via FSF.
4. Select the Reader to be adjusted.
5. Select **MUTL**.
6. Quit the message window 'Maintenance in progress...' at the Reader by touching the upper left and right corner of the display if applicable.
7. Select **For Design/ Scanner/ Scanner Sensitivity Data** and write down the following value:
Sensitivity HV value/ One Side HR:e.g. 491
Leave this screen with CANCEL.
8. Select **Scanner Check/ Correction/ Special Sensitivity Correction**.
9. Select via the **X-ray Tube Selection** the Tungsten tube.
10. In **Sensitivity Correction** enter the measured dose in [mR], e.g. 3.75, and click SET and OK.
11. After **10 minutes** the IP has been exposed put the cassette into the Reader.
12. Check for 'Result-OK' in the window of RU PC-TOOL.
13. Select **For Design/ Scanner/ Scanner Sensitivity Data** and write down the new HV value:
Sensitivity HV value/ One Side HR:
14. Leave the RU PC-Tool.
15. Repeat the sensitivity check. The S value must be in the range 108 ... 120 ... 132.
16. Make a backup of the scanner data (all).

9.6. Sensitivity Adjustment for High Resolution Type HR-BD

1. Expose the largest available size of the mammo cassettes, e.g. 24 x 30 cm.

Exposure condition: **25 KV, 20 mR / 174 µGy**, Molybdenum anode and filter
(about 5.60 mAs, cassette in slot)

Now you have 10 minutes for the next steps until the IP has to be read out.

Measured dose: mR time: :

2. Register (barcode) the IP under the examination **SERVICE/ TEST** and the view **SENSITIVITY**.
Be sure that this view is programmed to EDR = 1 (semi mode) and MRM code 0900 and **high matrix**.
For PCR Eleva: Create/ select the view **Sens high matrix**.
3. Start the **RuPcTool** at the FTP Server parallel to the normal application.
At Preview Unit:
- Press <Ctrl> + <Esc> to get the task bar of WINDOWS.
- Click on Start/ Run and browse for **c:\Program Files\FujiFilm\FCR\TOOL\RUPcTool\RUPcTool.exe**.
At PCR Eleva Workspot:
- Start RuPcTool via FSF.
4. Select the Reader to be adjusted.
5. Select **MUTL**.
6. Quit the message window 'Maintenance in progress...' at the Reader by touching the upper left and right corner of the display if applicable.
7. Select **For Design/ Scanner/ Scanner Sensitivity Data** and write down the following values:
Sensitivity HV Value/ Both Side (Front-side): e.g. 496
Sensitivity HV Value/ Both Side (Back-side): e.g. 666
Leave this screen with CANCEL.
8. Select **Scanner Check/ Correction**.
9. In **Sensitivity Correction** enter the measured dose in [mR], e.g. 18.05, and click SET and OK.
10. After **10 minutes** the IP has been exposed put the cassette into the Reader.
11. Check for 'Result-OK' in the window of RU PC-TOOL.
12. Select **For Design/ Scanner/ Scanner Sensitivity Data** and write down the new HV values:
Sensitivity HV Value/ Both Side (Front-side):
Sensitivity HV Value/ Both Side (Back-side):
13. Leave the RU PC-Tool.
14. Repeat the Sensitivity check. The S value must be in the range 108 ... 120 ... 132.
15. After a successful sensitivity adjustment perform the following Shading Speed correction.
16. Make a back-up of the scanner data (all).

9.7. Shading Speed Correction for High Resolution Type HR-BD

This procedure is a very critical one due to the fact that a Molybdenum tube does not lead to excellent results. If there is a chance to use a normal bucky system, please use it instead of the mammography system or keep the factory data.

1. Expose a HR-BD cassette of the largest available size, e.g. 24 x 30 cm.
Exposure condition: **25 KV, 15 mR / 130 µGy**, Molybdenum anode and filter
Alternatively: **80 kV, 15 mR**, SID = 1.8 m, without any filter, chest wall side of the cassette shows to the cathode of the tube.
2. Register (barcode) the IP under the examination **SERVICE/ TEST** and the view **SENSITIVITY**.

Be sure that this view is programmed to EDR = 1 (semi mode) and MRM code 0900 and **high matrix**.
For PCR Eleva: Create/ select the view **Sens high matrix**.

3. Select in MUTL **Scanner Check/ Correction/ Shading Speed Correction/ HR Speed** and click OK.
4. Put the cassette into the Reader.
5. Check for 'Result-OK' in the window of the RU PC-TOOL.
6. Perform a sensitivity check. Nominal value: $S = 120 \pm 10\%$ and there is no unusual non-uniformity.
7. Make a back-up of the scanner data (all).
8. Exit the RU PC-Tool and reboot the Reader.

9.8. Sensitivity Tolerances for Type ST and ST- BD

Dose:	1 mR $\pm 10\%$	Measured in 1% resolution, at 80 kV and in 1.8m distance, without any filter. The deviation from 1mR has to be entered in 1% accuracy as the correction factor into the Reader.
S value:	170... <u>200</u> ...250 180... <u>200</u> ...220	During check -15% and +25 % deviation After adjustment 10 % deviation

Pixel value at EasyVision RAD (10 bit resolution, 0 = black):

486... <u>511</u> ...536	5% deviation of the average value in main scan direction of the Reader, that means from the left to the right of a large size IP.
460... <u>511</u> ...562	10% deviation of the average value in subscan direction of the Reader, that means from top to bottom of a large size IP. The larger tolerance is caused by the tube (anode angle).

Pixel value at Workspot PCR Eleva (12 bit resolution, 0 = white):

	1850 ... <u>2050</u> ... 2250	5% deviation in main scan direction, 10% in subscan direction
Density on film:	1.2...1.5...1.8 1.0...1.3...1.6	No processing and curve 'a' of the lookup- table at EasyVision. UM processing and curve 'A' of the lookup-table at EasyVision.

If the exposures have been read out with L= 4 instead of L=1, the tolerances of the pixel values and of the density on film will decrease accordingly.

9.9. Sensitivity Tolerances for Type HR and HR-BD

Dose:	20 mR $\pm 10\%$	Measured in 1% resolution, at 25 kV and Mo/Mo. The deviation from 20 mR has to be entered in 1% accuracy as the correction factor into the Reader.
	3.6 mR $\pm 10\%$	Alternatively method at 80 kV and in 1.8m distance, without any filter
S value:	84... <u>120</u> ...156 108... <u>120</u> ...132	During check 30 % deviation After adjustment 10 % deviation

Pixel value at EasyVision RAD (10 bit resolution, 0 = black):

450... <u>465</u> ...480	In the region of interest 3.5 % deviation of the average value
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Pixel value at Workspot PCR Eleva (12 bit resolution, 0 = white):

1850 ... <u>2050</u> ... 2250	5% deviation in main scan direction, 10% in subscan direction
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